THE SANITARY EXAMINATION OF WATER SUPPLIES.

AN extremely valuable and interesting report[1] has been issued by the sanitary authorities of the City of Chicago on the results of the chemical and bacteriological examinations of the waters between Lake Michigan at Chicago and the Mississippi River at St. Louis for the purpose of determining their condition and quality before and after the opening of the Sanitary Canal. For the diversion from Lake Michigan of the sewage of Chicago and its inoffensive disposal towards the Mexican Gulf, a canal was cut to carry the sewage, much diluted with lake water, into the Illinois River, a distance of 29 miles. From this point the Illinois River, after a course of 289 miles, discharges into the Mississippi at Grafton, which is about 38 miles above St. Louis. The investigations originated from the fact that the State of Missouri and the City of St. Louis had applied for a Federal injunction against the further operation and development of the Sanitary Canal of the Chicago Sanitary District on the ground that the purity of the water supply of St. Louis was endangered thereby. Chicago replied by instituting a commission to examine into the condition of the waters between Chicago and St. Louis, a distance of 356 miles.

The Chicago Municipal Laboratory (Dr. Gehrmann), the University of Chicago (Prof. Jordan), and the University of Illinois (Profs. Palmer and Burrill) collaborated in the work, a common plan of operation was devised, a uniform scheme for the bacteriological and chemical examinations agreed upon, and forty stations were fixed for taking the samples, of which forty were collected weekly and delivered to *each* of the three laboratories. The work extended over a period of about thirteen months, and during that time some 8600 samples were examined. The investigations show that considerable self-purification has taken place before the Sanitary Canal discharges its sewage into the Illinois (29 miles), and that this continues until, before Averyville (159 miles) is reached, all trace of sewage pollution has disappeared from the waters of the Illinois. Since there is still another 188 miles to be traversed before any pollution could reach St. Louis, the possibility of Chicago's sewage endangering the purity of St. Louis's water must be dismissed as impossible. In all probability such an exhaustive series of observations over so extended a stretch of water for so long a period has never before been attempted, and the results obtained are of considerable general interest. A valuable feature of the report is the detailed description of the methods employed for both the chemical and bacteriological portions of the examinations. The report illustrates the proper manner in which a great question, such as it deals with, should be approached and a solution be sought for, and we commend its perusal to hygienic authorities in this country.

R. T. HEWLETT.

NOTES.

THE British Rainfall Organisation, founded in 1860 by the late Mr. G. J. Symons, F.R.S., will henceforth be carried on under the sole charge of Dr. H. R. Mill, Mr. Sowerby Wallis having been compelled by ill-health to retire after more than thirty years' connection with the association.

THE summer meeting of the Iron and Steel Institute was opened on Tuesday last at Barrow-in-Furness under the chairmanship of Mr. Andrew Carnegie, the president of the institute.

THE whaler *Terra Nova*, which has been acquired by the Government and fitted out as a relief ship for the *Discovery*, left Portland on Wednesday of last week for Hobart, Tasmania, where, as has been mentioned in a former issue, she will be joined by the *Morning*. In order that she may reach her destination as rapidly as possible, she will be towed as far as Aden by one of His Majesty's ships; from Aden she will have to depend on her own resources of steam and sail. It is, however, anticipated that the two ships, the *Morning* and *Terra Nova*, will be able to leave Hobart in order to make their way south through the Antarctic ice in search of the *Discovery* by December 1.

ACCORDING to a Reuter telegram from Brest, the steamer *Français*, with the members of the Charcot expedition, which is proceeding towards the South Pole in search of Dr. Otto Nordenskjold, left that place on Sunday afternoon last.

THE German South Polar Expedition has arrived safely at St. Helena.

A TELEGRAM from Naples on August 26 through Reuter's Agency stated that on that day a crater of Vesuvius which had been quiet since 1895 opened, and a great flood of lava poured forth.

A TELEGRAM from Wellington, New Zealand, states that an eruption of the Waimangu geyser took place on Saturday last, causing the loss of four lives.

ACCORDING to a telegram from New York a gold seeker has just arrived at Vancouver after an absence of four years, during which time he has been exploring the Mackenzie River district in the direction of the Arctic circle, and has brought with him what purports to be a piece of silk which formed part of the balloon of the ill-fated André.

WE regret to have to announce the death at Marstrand, Sweden, at the age of sixty years, of Prof. W. H. Corfield, sanitary adviser to H.M. Office of Works, and author of numerous works relating to hygiene.

A MONUMENT to the French chemist Laurent was recently unveiled by the French Minister of Agriculture at Langres (Haute-Marne).

THE *British Medical Journal* states that Dr. Stiles, who, it is said, has discovered a parasite which he believes to be effective in destroying mosquitoes, is about to put the efficacy of the destroyer to the test at Cape May or some other place in New Jersey where mosquitoes are prevalent. The investigation is undertaken at the request of Prof. Smith, State Entomologist of New Jersey, who has helped Dr. Stiles in his search for a parasite suitable for the purpose.

A REUTER telegram from Lagos states that the Legislative Council has passed a law making it a penal offence to introduce wireless telegraphy into the colony without the sanction of the Governor in Council.

ACCORDING to a telegram received through Laffan's Agency, Mr. Marconi, on his arrival at New York by the *Lucania*, stated that the vessel was never out of communication with either Great Britain or America on any day during the voyage. On Tuesday night of last week a message was received from Poldhu, when the *Lucania* was in mid-ocean, giving the result of that day's yacht race. The Nantucket station gave the result of Thursday's race. Mr.

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[1] "Report of Streams Examination." Made under the Direction of Arthur R. Reynolds, M.D., Commissioner of Health, City of Chicago. December, 1902.

Marconi added that he was going to consult Mr. Edison on four inventions he has recently made for improving his system, one being a method of reducing by one-half the high power now necessary for transmitting messages.

The inaugural address of the new session of the School of Pharmacy, in connection with the Pharmaceutical Society, will be delivered on October 1 by Dr. J. W. Swan, F.R.S., and the bust of the late Mr. W. Martindale will be unveiled on the same date, and the Hanbury gold medal presented to M. Eugène Collin for his researches in the natural history of drugs.

The Swiss Alpenklub will, according to the *Athenaeum*, hold its *Klubfest* at Pontresina on September 12, 13, and 14. The Morteratsch glacier has been chosen for the excursions.

A general meeting of mining engineers is announced to take place in Vienna from September 21 to 26, at which many papers of interest will be read and discussed. Simultaneously, there will be held a meeting of the Boring and Mining and Metallurgical Engineers for Styria and district.

The British Mycological Society will hold its seventh annual week's fungus foray at Marlborough from October 5 to 10. On the evening of Wednesday, October 7, Miss A. Lorrain Smith will read a note on *Gloeosporium Tiliae*, a disease of lime leaves, and Mr. Carleton Rea, the hon. sec. of the Society, will read a note on the occurrence of a Phalloid new to Britain. On the following evening the Rev. W. L. W. Eyre will deliver his presidential address, entitled "Mycology as an Instrument of Recreation."

The fine chemical laboratory of the University of Modena, Italy, was recently completely destroyed by fire, and the library of scientific works in connection with it, comprising 60,000 volumes, also perished.

An exhibition of electric automobile chairs is to take place in connection with the World's Fair at St. Louis next year. The chairs, according to the *Electrical World*, of New York, will have a uniform speed of three miles per hour, the operator having no control over the speed, and the same rate is maintained uphill, downhill, or on the level. The chair takes the form of a low phaeton without a cover. There are two large rear wheels and two small ones under the foot-rest. All are pneumatic-tyred; the seat is upholstered in cane. Behind the seat is a box which contains the batteries to operate the machine. If two persons desire to occupy the chair, and the service of a guide is wanted, the latter can sit on an adjustable seat at the rear. On the inside of the chair, attached to the arm, is a lever which puts the chair in motion or stops it at the will of the rider. A long lever attached to the front truck has its handle directly in the centre of the chair within easy reach of the driver. A gentle pressure guides the machine in the desired direction. A feature of the machine is a "sensitive rail" which surrounds the chair on all sides save at the rear. This prevents any accidents, for when the rail comes in contact with any object, even though it weighs but 1 lb., it presses against a device that locks the wheels and brings the chair to a dead stop.

We learn from the *Scientific American* that Prof. Langley's 12-foot aërodrome was tested on August 8. The model flew a distance of 600 yards and then sank in 22 feet of water. When it was finally recovered, all that was left was a tangled wreck of twisted wires. The time consumed in flight was not more than 45 seconds. The course described was a semicircle. According to accounts which have been published, the motor of the machine and the rudders failed to work properly. The altitude of the machine at the time of the fall was not greater than 50 feet. The airship is stated to have been driven by an 8 horse-power hydrocarbon engine connected up with two two-bladed propellers located one on each side of the machine at about its middle point. One four-bladed wind vane rudder was mounted behind the engine; then came the rudder proper. On each side the airship was supported by a pair of white silk wings, 4½ feet long by 2 feet in width. The propellers were located on the side between the wings and turned toward each other. The wings, rudders, engine and other running gear were fastened to a central cylindrical tube of aluminium 18 inches in length and about 4 inches in diameter, and tapering at both ends. The test of the small model will, it is said, be followed at an early date by a trial by the 60-foot aërodrome which is owned by the Government, the cost of which was 70,000 dollars.

With reference to the letter which appeared in our issue of August 6 from Prof. C. V. Boys concerning "The American Tariff and the St. Louis Exhibition," Mr. George C. Comstock, director of the Washburn Observatory, Madison, Wis., U.S.A., writes to say that the following letter received by him from the office of the secretary of the Treasury Department, Washington, illustrates the manner in which, in one class of cases, the American customs authorities have apparently overruled the plain intent of the statute cited by our correspondent. "The Department is in receipt of your letter of the 12th inst. in which you inquire whether photographic lenses imported for colleges and universities can be admitted to entry free of duty as scientific apparatus. Paragraph 638 of the Act of July 24, 1897, provides for the free entry of scientific apparatus, &c., when imported for educational institutions and the Department, and the Board of U.S. General Appraisers, have held that photographic apparatus, dry plates, lantern slides and lenses are not scientific apparatus within the meaning of said paragraph of law, and such articles, therefore, when imported for the use of educational institutions would be liable to duty." Whether the above represents a policy of the Treasury Department in cases other than those named it is impossible to say, but it may serve to illustrate the danger of relying upon a lay interpretation of the Tariff Act, and the need for determining in each particular case the policy pursued in the custom house. The possibilities of interpretation presented by a Board of Appraisers that holds photographic lenses not to be scientific apparatus seem unlimited.

A feature of the mosquito as the agent of malaria that has in the past been difficult to understand is that occasionally a locality is found where the physical conditions appear to be such as to favour the development of malaria, susceptible species of anopheles abound, and yet malaria is absent. Not only do such areas exist in some cases in immediate proximity to active foci of the disease, but the introduction of persons whose blood contains the malarial parasite is unattended by the development of malaria in others. The mosquitoes of such immune areas appear, in fact, to be insusceptible, but the cause has been hitherto unknown. The researches of Dr. Schoo, however, to which Lieut.-Colonel Giles directs attention in the April number of the *Indian Medical Gazette*, offer an explanation. Dr. Schoo observed that, so long as they were fed on acid fruits, it was extremely difficult to infect mosquitoes with the malarial parasite, while they were easily infected when the acid food was withheld. This observation accords with a point noticed by Prof. Celli, who has stated that one of the Italian immune areas is remarkable for an enormous development of the cultivation of the tomato, a fruit rich in vegetable acid, and an attractive food for mosquitoes. The necessity of further investigation of this matter is clear, for if confirmation is obtained, such knowledge may be of much importance in its practical application for the prevention of malaria.

THE micro-balance exhibited by Prof. Nernst at the Berlin congress is described in a recent number of the *Berichte,* and a number of results are given which illustrate its remarkable sensitiveness and accuracy. The control is a stretched quartz fibre, and the pointer moves over forty small divisions, each of which represents 0·03763mg., and can be read to a twentieth part. The scale pan is a tiny platinum tray weighing only 20mg., and in this the analyses are carried out. Three analyses of calcite, in each of which less than 3mg. was taken, gave $CO_2 = 43{\cdot}80$, 43·66, and 43·81 per cent., theory 43·96, and the ignition of a single milligram of yttrium sulphate gave the atomic weight as 88·0 and 87·8, theory 89. The balance is specially suited for the analysis of traces of rare earths, and an attempt was made to carry out a fractional distillation of the chlorides of yttrium, erbium, and ytterbium in a platinum tube, but analysis showed that the sublimate had the same composition as the residue. Even where considerable quantities of material are available, as in the analysis of the salts of organic acids, the use of the micro-balance would lead to a great reduction of time and trouble, as it would only be necessary to read the deflection before and after igniting a trace of the salt. The balance, in a portable form, is manufactured by Messrs. Spindler and Hoyer, at Göttingen, and is sold at 70 marks.

OWING to the growing use of fused quartz in physical and chemical experiments, considerable interest attaches to determinations of the coefficient of thermal expansion of this substance. Several papers on this subject are before us. Messrs. L. Holborn and F. Hemming, in the *Annalen der Physik* (4) x., find an average value for the coefficient of expansion between 0° and 1000° of $5{\cdot}4 \times 10^{-7}$, but consider that the relation between length and temperature cannot be adequately expressed even by a quadratic formula within these limits. Mr. Karl Sheel, using optical interference-methods, and working with the temperatures 15°, 56° and 100°, obtains between these temperatures the formula

$$l_t = l_0(1 + 0{\cdot}322 . 10^{-6}t + 0{\cdot}00147 . 10^{-6}t^2),$$

while for expansion of crystalline quartz parallel to its principal axis he finds

$$l_t = l_0(1 + 7{\cdot}144 . 10^{-6}t + 0{\cdot}00815 . 10^{-6}t^2).$$

In the *Bulletin des Séances* of the French Physical Society, M. A. Dufour, in treating generally of the uses and properties of fused quartz, refers to the work of Holborn and Hemming, Le Chatelier and Callendar, and points out the difficulty of forming junctions between the quartz and metal or glass, consequent on the low coefficient of dilatation of the former. Mr. Sheel finds confirmation of his results in a recent paper by Chappuis, who also used optical methods in his determinations.

IN the July issue of the *Quarterly Journal of Microscopical Science,* Dr. R. Evans, of the Georgetown Museum, describes a new species of Peripatus from British Guinea, illustrated with a coloured plate. The species is said to be markedly different from the other members of the group from the same district. The author remarks that measurements and descriptions of colours and markings from preserved specimens are of little value in specific discrimination, and are, indeed, liable rather to cause confusion. In the same journal Dr. G. C. Bourne describes and figures a new ascidian (*Oligotrema psammites*), belonging to the family Molgulidæ, dredged off New Britain. The peculiarities of the new form are twofold. Firstly, it differs in general appearance and structure from the other members of the group, presenting a superficial resemblance to a sea-anemone. Secondly, as indicated by the occurrence of small crustaceans in its interior, it has a different class of nutriment. It is, in fact, "an ascidian which captures and feeds on active crustacea of large size relatively to itself, and is no longer dependent on minute organisms and organic débris swept into its branchial chamber by ciliary currents."

"THE BUILDING OF THE GRAMPIANS" is perhaps about as difficult a geological subject as could be found, but thanks to the labours of James Nicol, Sir A. Geikie, Prof. Lapworth, and others, much has been done, while the memoirs and maps of the Geological Survey form a good basis for further work and criticism. Mr. Peter Macnair has dealt boldly and confidently with the subject (Royal Phil. Soc., Glasgow), his object being to bring out the striking similarity which exists between the structure of the Grampians on the one hand and the Alps on the other, the Grampians being regarded as simply the basal wreck of such a mountain chain as the Alps. He is more confident than others are of the succession of the rock-groups met with in the Highland schists, but when he comes to criticise the belt of supposed Arenig rocks along the southern Highland frontier, he finds that there no reliance can be placed upon the apparent order of succession. He may be right in maintaining that there is nothing to justify the separation of this supposed Arenig belt from the crystalline schists. He may be right also in his criticisms on the structure of the Cowal region, with especial reference to the development of the foliation planes. This much may be said, that while hammering earnestly at the rocks, he has also made a careful study of the work of others, and he attacks the Highland problems with evident enthusiasm for his subject. We must leave to those concerned the defence of the positions which he assails, although in some instances Mr. Macnair has advanced, perhaps, where others fear to tread.

PROF. JOLY has done well to undertake the petrological examination of paving sets. In the first part of his work (*Sci. Proc.* Royal Dublin Soc., vol. x., No. 5) he deals more particularly with certain granites, diorites, and dolerites. In his general remarks he observes that the resistance to wear varies directly, as do the amounts of quartz and felspar, the holocrystalline igneous rocks being as a rule the toughest. Markedly porphyritic, vesicular, and glassy rocks are to be avoided. He deals with the durability and with the character of the surface produced by various paving sets, remarking that mechanical forces are applied on the roads in the most destructive form, the attrition and crushing being combined with the solvent action of impure waters. Fine-grained rocks, such as the diorite of Penmaenmawr, may become too slippery for use on inclined surfaces; a certain coarseness of grain is usually desirable.

WE have received the annual report (vol. xii.) of the Geological Survey of Canada for 1899 (dated 1902), by Dr. Robert Bell, acting director. This is a bulky work made up of various independent reports lettered A to S, and separately paged. Reference has already been made in NATURE to the more important matters dealt with. A general index is appended, which gives the paging under the reference letter of each report. The volume is accompanied by maps of the Klondike Gold-fields, and of parts of British Columbia, Ontario, Quebec, and New Brunswick.

AN orographic sketch of Korea, with photographic illustrations and an excellent map, has been published by Dr. B. Kotô (*Journ.* Coll. Science, Tokyo, Japan, vol. xix.). He discusses the various faults and folds which have influenced the scenery of the peninsula—a region which, as he remarks, in reference to Suess and Richthofen, "seems to have interested our two masters almost as deeply as it has the political leaders of our times." The Cretaceous Cephalopoda from the Hokkaidō are under description by Mr. H. Yabe. Part i., dealing with Lytoceras, Gaudryoceras, and Tetragonites, is accompanied by seven plates (*Journ.* Coll. Science, Tokyo, vol. xviii.).

MR. F. CHAPMAN AND MR. H. J. GRAYSON contribute an article on "Red Rain" to the *Victorian Naturalist* (vol. xx., June). After discussing the subject generally, they direct attention to falls of red mud in Victoria in February and March of this year. In one case the amount was estimated to equal fifty tons per square mile. The material comprised much limonite, and many mineral fragments and diatoms. The material was probably derived from areas from 30 to 300 miles north and west of Melbourne, being swept up from the borders of swamps and salt lakes during an abnormal season of drought.

IN a monograph supplement to the *Psychological Review* (vol. v. No. 4), Mr. J. B. Miner reports a study of "Motor, Visual, and Applied Rhythms." It has been frequently asserted that rhythmical grouping of sensory impressions is peculiar to auditory and tactual perception, but Mr. Miner shows that a series of similar visual impressions regularly repeated may fall into spontaneous rhythm, and that, in fact, visual impressions obey laws of rhythm very similar to those established for auditory perception. Since rhythm is, as Mr. Miner rightly maintains, a feature of the motor expression evoked by sensory impressions to which the attention is directed, there is no reason to suppose that it should be limited to perception by any one or two of the senses, and it may be hoped that the erroneous statement to that effect will now disappear from the text-books. Mr. Miner shows that subjects seem to fall naturally into two classes, according as their power of concentrated mental work is favoured or hindered by a concurrent rhythmical stimulus to the senses; that those who naturally work most rapidly and concentratedly are most apt to be hindered, while those who work slowly, with less tense concentration, in many cases produce better results under the influence of such stimulus. This unexpected result suggests to the author certain pedagogical reflections.

THE *Barbados Agricultural Reporter* of August 1 contains the text of a petition to the Governor praying that the destruction of mongooses may be authorised in the island. A quarter of a century ago the sugar industry of the island suffered much from the depredations of rats, and about 1878 mongooses were introduced for the purpose of thinning their numbers. These carnivores discharged their task with conspicuous success, but at the same time they cleared off much of the indigenous fauna. The destruction of the lizards has led to a large increase in the number of moth-borer caterpillars, which perforate the sugar-canes and thus give entrance to the spores of noxious funguses. These cause a serious loss, which it is hoped may be in some degree mitigated by the destruction of the mongooses. All this shows the danger of attempting to interfere with the equilibrium of nature.

IN the annual report of the Indian Museum, Calcutta, for 1901–2, Major Alcock, the director, states that a bronze medallion portrait and inscribed brass tablet have been placed in one of the verandahs of the old museum building in memory of the late Dr. J. Anderson, the first superintendent of that institution. During the period under review the museum has acquired by purchase the valuable de Nicéville collection of Oriental butterflies, which includes a large number of type specimens.

THE *Journal* of the Straits branch of the Royal Asiatic Society contains two important communications on the language of the Sakais and Semangs of the Malay Peninsula. Mr. H. N. Ridley describes some new Malay orchids, while Mr. P. Cameron continues his account of the Hymenoptera collected by Mr. R. Shelford in Sarawak. To the *Zoologist* for August, Mr. Shelford himself contributes some highly interesting notes on the habits of Bornean species of mantises, with illustrations reproduced from photographs of these insects.

IN the journal last mentioned, the Rev. F. C. R. Jourdain records the occurrence of an example of the harp-seal (*Phoca groenlandica*) at Teignmouth on March 10, on what appears to be sufficient evidence. The carcase was seen on a fishmonger's barrow, but it is not known how it was disposed of. The species is a very rare straggler to the British shores.

THE recent additions to the Municipal Museum of Hull are made known to the public by means of illustrated notes and short articles in the *Eastern Morning News.* These are subsequently reprinted as penny pamphlets under the title of "Hull Museum Publications." By this means the local public are kept in touch with the growth of the museum, and it certainly must benefit the museum, as well as interest and instruct the public. This system might with advantage be copied by other local museums. The fifteenth publication, entitled "Quarterly Record of Additions, No. 5," has just been published.

THE report of the Trivandrum Museum for the year 1901–2 contains a reprint, with two coloured plates, of a paper from the *Journal* of the Bombay Natural History Society, on a couple of cetaceans recently stranded on the beach near that city. One of these has been identified by Mr. Lydekker with the widely spread *Pseudorca crassidens,* while the second is made the type of a new species, *Tursiops fergusoni,* named in honour of the director of the museum.

IN a third museum report just to hand, that of Manchester for the year 1902–3, special attention is directed to the acquisition of the interesting series of mammalian remains from a cave of Pliocene age at Doveholes, Derbyshire. These remains, which it will be remembered were exhibited at the soirée of the Royal Society in the spring, have recently been described by Prof. W. B. Dawkins in the Geological Society's *Quarterly Journal.*

THE *Zoological Society Bulletin*, published by the New York Zoological Society, is a brightly written, well illustrated periodical, and the July issue, which has just reached us, contains quite a number of interesting contributions, notably one on "Training Orangs and Chimpanzees," in which particulars are given of the acquired accomplishments of past and present members of the New York Zoological Park collection. The training of the orang-utan and the chimpanzee remarks the writer of the article, closely approaches the management of an untaught child. These creatures do not seem as much like lower animals as do the majority of the so-called "dumb brutes." Coaxing and perseverance have been responsible for the exhibitions which from time to time have taken place.

In the *Journal of Botany* (August) Dr. G. Murray publishes a short note on Atlantic diatomaceæ. Some few species were obtained in all the captures, even far out at sea, but an increase in the quantity of the take was generally found to indicate the proximity to land. Miss A. L. Smith describes some interesting microfungi, and Dr. W. G. Smith refers *Nidularia dentata* to the genus Sphærobolus. Biographical notices of the botanists L. A. Deschamps and F. Noronha are contributed by the editor.

The number of the *Minnesota Botanical Studies* published in July is mainly given up to articles dealing with flowerless plants. Mr. Bruce Fink presents a list of lichens collected on the northern boundary, and Mr. H. L. Lyon catalogues the pteridophyta which grow in the State. Contributions to the algal flora are furnished by Dr. H. F. Schrader, who describes a new species of Alaria, and by Mr. Skinner, who discusses the tide pool vegetation at Port Renfrew. The distribution differs considerably from that found on our coasts, seeing that a Corallina extends throughout the whole tidal range, while a Codium is associated with it in the higher pools.

The *Agricultural News* of Barbados for August 15 reprints from the *India Rubber World* an interesting article on the subject of the preparation of Para rubber in Ceylon, in which full and detailed instructions are given for collecting and coagulating the rubber. The text is elucidated by illustrations.

A pamphlet on "The Boiling Lake of Dominica," by Mr. F. Sterns-Fadelle, has lately been published (office of the *Dominican,* price 1s.). It gives an historical and general account of this well-known geyser, which will be useful to travellers in the West Indies.

The annual report of the Yorkshire Philosophical Society for 1902 contains part ix. of a catalogue of British plants in the herbarium of the Society, and a popular article on "Sea Sand," by Mr. Hugh Richardson, in which the characters and origin of the grains of sand are discussed.

In the *Proceedings* of the Nova Scotian Institute of Science (vol. x. part iv.) Dr. H. M. Ami shows that the slates yielding *Dictyonema Websteri*, and which were regarded by Sir J. W. Dawson as Upper Silurian, belong to the Upper Cambrian.

A pamphlet entitled "A Historical Sketch of the Experimental Determination of the Resistance of the Air to the Motion of Projectiles," by the Rev. Francis Bashforth, has recently been published by the Cambridge University Press.

Messrs. Charles Griffin and Co., Ltd., have published a second edition of "Animal and Vegetable Fixed Oils, Fats, Butters, and Waxes," by the late Dr. C. R. Alder Wright. The new edition has been revised and partly rewritten by Mr. C. Ainsworth Mitchell, who, though he has retained the general arrangement of the original work, has, especially in the chapters dealing with the manufacturing processes, modified the text and brought it up to date.

A ninth edition of Bloxam's "Chemistry" has been published by Messrs. J. and A. Churchill. The book has been rewritten and revised by Prof. J. M. Thomson, F.R.S., and Mr. A. G. Bloxam. A change has been made in the present edition in the order of treatment of the non-metallic elements, and carbon is now considered after hydrogen, oxygen, and nitrogen. The plan of making no division, in the portion of the book dealing with organic chemistry, between the treatment of the fatty and aromatic compounds has again been followed.

A new edition—the twelfth—of "The Art of Retouching," by Mr. J. Hubert, has just been issued by Messrs. Hazell, Watson and Viney, Ltd.

Messrs. George Routledge and Sons, Ltd., announce for early appearance a series of "Nature-Study Readers" for general school use, under the editorship of Mr. John C. Medd. The aim of the books is to present varied aspects under which nature may be most conveniently studied alike in urban and in rural districts. Each subject is to be treated by a different writer, who has devoted special attention to it, and knows from personal experience what is within the capacity of, and calculated to interest, children of from nine to thirteen years of age.

Mr. R. Lydekker, F.R.S., will shortly issue, through Messrs. Hutchinson and Co., a volume of zoological essays entitled "Mostly Mammals."

The additions to the Zoological Society's Gardens during the past week include a Himalayan Bear (*Ursus tibetanus*) from East Asia, presented by Lady Constance Mackenzie; a Common Otter (*Lutra vulgaris*) from Scotland, presented by Mr. J. B. A'Deane; a Rock Thrush (*Monticola saxatilis*), European, presented by Mr. W. H. St. Quintin; a Delalande's Gecko (*Tarentola delalandii*) from West Africa, presented by Mr. P. C. Challice; a Black Lemur (*Lemur macaco*), a Black-headed Lemur (*Lemur brunneus*) from Madagascar, a Black Sternothere (*Sternothoerus niger*) from West Africa, seven Dalmatian Lizards (*Lacerta mosorensis*) from Dalmatia, twelve Sharp-headed Lizards (*Lacerta dugesi*) from Madeira, an Indian Eryx (*Eryx johni*) from India, a Black-tailed Snake (*Ungalia melanura*), a Black-spotted Snake (*Ungalia pardalis*), a Cuban Snake (*Liophis andreae*) from Cuba, deposited.

OUR ASTRONOMICAL COLUMN.

Spectrum of Comet 1903 *c*.—Observations of the visual and photographic spectra of this comet were obtained at the Meudon Observatory, and were communicated to the Académie by M. Deslandres, whose communication appears in the *Comptes rendus* for August 17.

A spectrograph containing a 60° heavy flint glass prism was especially constructed for these observations, and was used in conjunction with the large double telescope. The faint light of the comet was concentrated from a wide slit by having the collimator of the spectroscope 55cm. long, whilst the focal length of the observing telescope or camera was only 12cm.

The spectrum generally is of the characteristic hydrocarbon type, but near to the nucleus of the comet it contains several extra faint lines; the brightest bands are those at λλ 3881, 4681, 4314 and 4052, their relative intensities being 10, 8, 7 and 7 respectively. The blue bands at λ 473 are separated into their several groups, thus affirming the presence of the hydrocarbon spectrum; this separation was also noticed in the spectrum of Rordame's comet (1893 *b*) obtained by Campbell at Lick in 1893, with which Deslandres's spectrum is practically identical.

M. Deslandres proceeds to note the similarities and differences of the cometary spectrum and the cyanogen spectrum as obtained in laboratory experiments, and suggests, as an explanation of the differences, that, although